Rurality, healthcare and crises: investigating experiences, differences, and changes to medical care for people living in rural areas

Abstract

Healthcare provision in rural areas is a global challenge, characterised by a dispersed patient population, difficulties in the recruitment and retention of healthcare professionals and a physical distance from hospital care. This research brings together both public and doctor perspectives to explore the experience of healthcare across rural Scotland, against the backdrop of contemporary crises, including a global pandemic and extreme weather events. We draw on two studies on rural healthcare provision to understand how healthcare services have been experienced, changed and might move on after periods of short- and longer-term change caused by such crises. We highlight the importance of communicating service changes to aid in setting healthcare expectations and advocate a mixed approach to the introduction of digital solutions to best balance access to services in rural areas with the challenges of digital connectivity and literacy.

Introduction

Providing rural areas[i] with appropriate health services is a key challenge for governments across the globe (Hanlon & Kearns, 2016). Rural areas can be characterised (Weinhold & Gurtner, 2014) by dispersed low population numbers, lack of economies of scale, difficulties in the recruitment and retention of healthcare professionals, and uneven infrastructure development. The COVID-19 pandemic offers a new lens through which to consider strengths and weaknesses of contemporary rural society (Maclaren & Philip, 2021), including healthcare, and how it has thrown challenges in rural places (Malatzky et al., 2020a) into sharper relief in relation to other place-based social, cultural, economic, environmental, and political issues. Whilst the initial aim of this project was to solely consider the COVID-19 pandemic, the storms of 2021 and 2022 - which we go on to discuss - present an additional factor to consider within the context of evaluating the impact of sudden and unexpected challenges on the delivery of rural healthcare.

This research draws on primary data from two complementary projects. The first project is a pilot study that aimed to explore the public's perspectives on accessing

and receiving healthcare in rural areas of Scotland, within the context of a changed environment due to the COVID-19 pandemic. This research considered what people living in rural communities valued about health services, and if COVID-19 had changed this, and explored what changes might be sustainable into the future for rural areas and what changes might be time-limited to the pandemic. The second project's primary aim was to explore the motivations of doctors to live and work in rural areas (reported elsewhere: Authors-a, 2022a, 2022b, forthcoming; Authors-b, 2023). However, as the project was planned prior to the pandemic, delayed because of it, and started amidst it, many of the doctors interviewed had their own reflections on delivering healthcare within that changed environment and the opportunity was taken to engage in a discussion on this. The research therefore brings together both public and doctor perspectives to explore the contemporary experience of rural healthcare, against the backdrop of crises, including the pandemic, and the associated challenges that brought.

In this paper we discuss the underlying context within the literature on rural areas, healthcare delivery and the COVID-19 pandemic, followed by a review of our qualitative methodological approach. We then present findings from the two complementary qualitative research projects across two areas. First, we present a summary of the contemporary experience of rural healthcare and second, a reflection on how this has been impacted by both the COVID-19 pandemic and extreme weather events experienced within Scotland. Both these events show how relationally entwined the delivery of rural healthcare is with debates on sustainable rural communities, the climate emergency, digitalisation of health services and recruitment and retention of healthcare staff in rural areas. We anticipate that this study's findings will be helpful in informing local priorities for rural health services. As clinical services are restructuring and re-prioritising the services and care offered, and public perspectives are often lacking, this research offers valuable findings to inform what to do now as well as possible interventions for the future.

Research context: Rurality, health and the pandemic

The impacts of COVID-19 have not been felt equally across society (Bambra et al., 2020), with factors such as age, ethnicity, income, geography and health all contributing to the difference in experience. Place has been a differentiator that merits

65 further research, specifically the experience of rural areas, which are often forgotten
66 in research (Mueller et al., 2021). Our research continues calls for "place-sensitive'
67 research (Malatzky et al., 2020b p. 1; see also, Malatzky et al., 2020a; Maclaren &
68 Philip, 2021) on the COVID-19 pandemic and moving beyond pandemic narratives
69 from high income countries of 'escape to the country'.

70 From our own scoping review, Table 1 shows how much of the research on health,
71 rurality and the COVID-19 pandemic has been focused on telemedicine, its efficacy,
72 and the associated population to be treated.

Research area	**Useful references**
telemedicine/health/E-consultation/digital healthcare options and its use and satisfaction by patient populations and/or staff	Pit et al., 2021; Saigi-Rubio et al., 2021; Segui et al., 2020; Curtis et al., 2021a; Bhattacharyya & Mandke, 2022; Butzner & Cuffee, 2021; Chasco et al., 2021; Delacretaz et al., 2020; Jiang et al., 2021a; Lapadula et al., 2021; Rush et al., 2021; Thomson et al., 2021
associated efficacy of telemedicine for different aspects of medicine or healthcare	treating addiction: Cole et al., 2021b, Hughes et al., 2021 managing dementia patients: Sekhon et al., 2021 cancer care: Das Adhikari et al., 2021, Jiang et al., 2021b neurology: Strowd et al., 2021; psychiatry: Almalky & Alhaidar, 2021 telegenetics: Rao et al., 2021 urology: Beller et al., 2020 surgery: Riew et al., 2021
the patient population to be treated	older people, Davoodi et al., 2021; Padala et al., 2020; Shah & Tomlijenoci-Berube, 2021; Svistova et al., 2021; Powell & Alexander, 2021; paediatrics: Edwards & Parry 2022
digital divides that rural areas often experience, and the associated technological	Mohammed et al., 2021; Clare, 2021; Das et al., 2020; DeGuzman et al., 2022; Finazzi et al., 2020;

cautions in implementing different systems.	James et al., 2021; Meyer et al., 2020; Piaggesi et al., 2020

Table 1: Research summary: COVID-19 and telemedicine

What we want to do in our research is extend this beyond solely a focus on health services, but instead take ‘place’, specifically rurality and those who live there, as the starting point to understand more holistically and relationally how the pandemic affected people’s lives. Our research explores the experiences, differences and changes to medical care for people living in rural areas, covering issues noted above but taking a broader perspective to understand the place-based context of individuals, whether doctors across Scotland or the public in rural areas of Scotland. This work considers broader issues of rural healthcare and the changes caused by the COVID-19 pandemic, including perceptions and access to care (Hoerold et al., 2021; Podubinski et al., 2021; Lister & Lister, 2021) as well as public policy (Apostolopoulos et al., 2021a,b; Mathews et al., 2021), and the exacerbation of already existing inequalities (Hill et al., 2022; Nalubega et al., 2021; Logan & Castaneda, 2020).

This research puts the public’s perspectives and experiences up front, but is not forgetful of the range of work that has considered healthcare professionals’ experiences during the pandemic (Burn et al., 2022; Aditya et al., 2021 ; Kwaghe et al., 2021; Miller et al., 2020; Otu et al., 2021; Egan & Bonar 2020), including work on management structures and leadership during the pandemic (Schou, 2021), workforce solutions (MacLeod et al., 2021; Marshall & Aileone 2020; Cole et al., 2021a), workforce needs (Brown-Johnson et al., 2021), learning environments (Ramos-Morcillo et al., 2020; Mak et al., 2021), and place-specific aspects of practising in rural or remote locations (Campbell et al., 2021; Segel et al., 2021).

Our research explores the gap in the literature on how the nature of places has affected access specifically, in line with Malatzky et al.’s (2020b, p. 1) argument for ‘place-sensitive research’ in rural areas as ‘scholars engaged in place-sensitive research have a critical role to play in … increasing understanding and acceptance of why place matters in broader societal and political domains’ (Malatzky et al., 2020b, p.4). This focus continues and extends research on the varied nature of rural places (Woods, 2012), and calls for place-based research that is important in developing policy for rural areas (Atterton & Glass, 2022).

Methods

The study draws on two complementary pieces of empirical work from two related studies. First, in exploring the public's perspectives, original primary data was gathered through multiple methods including asynchronous online discussion blogs as well as synchronous[ii] online or telephone focus groups and interviews[iii]. This empirical research comprised two discussion groups and 15 interviews (totalling 19 participants) all of whom lived in rural areas of Grampian, alongside written responses to discussion boards or to the chief investigator directly. Interviewees and focus group participants were recruited through advertising online via blog posts, Twitter and contacting community groups using online available emails. A press release from our university about the research was also picked up and featured in the regional written and radio press. This latter part helped us to at least mitigate those who may not have seen our recruitment strategies on digital platforms. Interviews and focus groups lasted around one hour, were conducted over telephone and MS Teams owing to participant preference and pragmatics around travel or local restrictions, during which the discussions were audio recorded (with participants' consent) and transcribed verbatim. The qualitative data was then analysed thematically with initial separate readings by the team's primary researchers, alongside further comment and discussion from the wider team. The chief investigator then led further refinement of analysis in discussion with the research team in writing up the research findings.

Second, we draw on original research that included questions of the impact of the COVID-19 pandemic on doctors' experiences of working in rural Scotland (See related findings: Authors-a, 2022a, 2022b, forthcoming; Authors-b, 2023). This second doctor-focused study complements and extends findings from our first study which focused on the public. The interviews in the doctors' study consisted first of 10 interviews on service provision with doctors in positions of authority within rural healthcare delivery (see: Authors-a, 2022a) and then a further 46 interviews with doctors on their individual work decisions and biography (see: Authors-a, 2022b, forthcoming-c; Authors-b., 2023). These interviews were conducted over MS Teams or by telephone owing to national restrictions at the time of research.

Doctors were recruited through multiple channels, including society email lists (e.g., Rural General Practice Association of Scotland), General Practice clusters, and

135 snowball sampling. Doctors who currently worked in rural and remote settings were
136 primarily recruited, but others who had worked or trained in rural and remote settings
137 and since moved elsewhere, and those who had never worked in such settings were
138 also interviewed. Interviews were conducted as conversations with a purpose and
139 were semi-structured with some pre-determined questions based on literature themes
140 and some on contemporary issues such as the COVID-19 pandemic. Like the first
141 study, analysis was undertaken thematically, separately, by the primary research team
142 who then refined themes in discussion with the wider team. The co-investigator
143 continued this analysis for all interviews again, developing the coding framework both
144 deductively and inductively.

145 The findings reported here are drawn out as key recurring themes within the research
146 that spoke to questions of rurality and healthcare, and crises, compared across the
147 two projects. All names presented are pseudonyms, with an associated age range for
148 public participants to maintain anonymity, or a job description for doctor interviewees
149 to provide context.

150 Findings

151 *Place and Rurality: The contemporary view*

152 All conversations, from the public and doctors, involved an invitation for participants to
153 introduce where they lived, followed by a discussion around their understanding of
154 what ‘rural’ and/or ‘remote’ meant to them. These responses aligned with social
155 constructivist views of rurality (Cloke, 2006; Halfacree, 2006; Woods, 2011) where
156 they were contextual to individuals, their place in the world, their background and what
157 they have seen in wider society. Rural meant different things to different people. One
158 repeated theme was access to services, with an acknowledgement of that being more
159 of a challenge in rural areas. Many conversations about rural healthcare services
160 reflected wider considerations of rural life, focusing on changes that have occurred
161 within the wider provision of services in rural areas over a number of years, before any
162 impact from the pandemic was felt:

163 *When I first was married, there was a van that came round – the grocer, there was a*
164 *butcher’s van, there was a fish van, there was a regular postman, binman, you name*
165 *it: the services actually came to rural areas. My husband can still remember when the*

bank manager used to come and visit him, well I don't think anybody has that now. So, you had your bank manager, your doctor, all of these services [were] actually here. Now, I know lots of people now that are looking to move houses because they realise that because there are no bus services now, that there are no services, Places are going to be haemorrhaging people, that might have stayed longer in a rural area but are scared if they couldn't drive – if you couldn't drive and you live where I am, it would be impossible…. We have no banks here now hardly, there's no post offices. The medical service, long ago, was far superior to what it is now. (Catriona, age 55-64)

This interviewee highlights some of the common issues we heard from our public interviewees about rural life, points reflected in wider research (Woods, 2011, 2012, 2020) such as the lack of transportation options and reduction in local services, including healthcare provision. Within healthcare provision, one common theme, from both doctors and the public, was continuity of care. This was frequently perceived as a previous strength of rural healthcare delivery, but one that was declining:

when we used to phone our doctor's surgery… the doctor knew you. Right? I'm not saying we were friends or anything, but they knew everybody in the practice, from the receptionist to the nurse, and they would know our family (Catriona, age 55-64)

The GPs, in the main, in [the town], pre-pandemic, there were a number of mature ones and they were very learned and very experienced and not only were they that in the diagnosis and the treatment but they were also very – knew the families and knew the social circumstances and housing and employment opportunities for people and they knew them, so therefore they could look at it as a whole, much more (Charlotte, age 65+)

Continuity of care was valued both by the public and by doctors:

I think once you get to know your patients and you start to know the kids as they're growing up, I think, I think it's a wonderful life, and it's much easier to be a GP if you know the patients really well 'cause it makes your job easier. You have to be careful and bring somebody in from time to time to check that you're not missing anything 'cause you get that kind of... you get blasé with them, but it, it makes that… that continuity makes the job ten times easier. (Victor, GP Partner[iv])

196 The opportunity to provide continuity of care is often highlighted as a motivation for
197 doctors to work in rural locations (World Health Organisation, 2020; Marchand &
198 Peckham, 2017; Roos et al., 2014). However, the changing structure of healthcare
199 delivery in general, with a move to multidisciplinary teams and centralisation of
200 services meant this traditional view of a single GP knowing everyone in a village or
201 sparsely populated area is no longer a common experience. In addition, the current
202 challenge for GP practices of recruitment and retention (Authors-a, 2022a) has led to
203 the use of allied health professionals as an alternative and to triage patients to save
204 doctors' time. This use of wider health professionals (e.g., Advanced Nurse
205 Practitioners; Advance Practice Paramedics), as part of the multidisciplinary primary
206 care team that the new GP contract in Scotland champions (The Scottish Government,
207 2017), was frequently referenced by the public in their consideration of the changing
208 landscape of rural healthcare delivery. The worry for many of the public we interviewed
209 was around a perceived change that they were no longer being seen by a doctor, when
210 they thought they perhaps should be, worrying then about wasting their own time and
211 the time of practice staff where they felt they saw the wrong person initially in getting
212 to grips with their health issue.

213 Centralisation of services has also disproportionately affected rural areas, given the
214 distances required to travel to a central location and the frequent lack of public
215 transportation options. Clinics that might have once been held in a local village practice
216 are now often centralised in the rural general hospitals or in one GP practice covering
217 a much wider area. Catriona highlights the challenges this can bring:

218 *There is the distance aspect. My mother-in-law has got, for the last year or so, got*
219 *Alzheimer's, now quite honestly, even trying to get her into a car, taking her fifteen*
220 *miles to go and see a nurse is too much. (Catriona, age 55-64)*

221 Centralisation of services and the increased use of a wider range of health
222 professionals are also symptoms of the increased workload of general practitioners,
223 including in rural locations, and such workload challenges were noticeable for the
224 public in their surgeries as Morven articulated:

225 *I just asked, you know – what the system is now because we find it a bit difficult to*
226 *understand. And she kind of told me that they are contracted to the NHS. Now, we*
227 *weren't really aware how the practices work but that's what she says and obviously*

228 *they have to fund everything themselves when they get their allowance from the NHS*
229 *and she's finding that extremely difficult. And I felt for the girl because she's been there*
230 *ten years and she's only just, I think, become a partner. She and one other. And I did*
231 *get an impression that she's overworked, basically, the pair of them are. Because she*
232 *told me, 'Well don't think we've not been doing anything all the time of the pandemic,*
233 *we have, and sometimes we don't leave here until ten o' clock at night. We start at seven*
234 *in the morning or seven thirty or something.' So, I came away thinking, well poor girl,*
235 *she is…you know…she's struggling, and she can't get doctors to fill the gaps, I think,*
236 *I don't know how many gaps they have but, eh there is just nobody available. (Morven,*
237 *65+)*

238 These existing challenges within the provision of rural healthcare – the issue of
239 continuity of care, funding pressures, GP practice ownership/management, and
240 recruitment and retention of GPs – have created an established fragility in service
241 delivery before any further external pressures are introduced.

242 Crises and change

243 2020 introduced one of the largest health challenges of the last two centuries, the
244 COVID-19 pandemic. As governments, businesses, communities and individuals
245 adapted and modified their behaviours according to local, regional, national and
246 international guidelines and rules, the pandemic fundamentally changed the nature of
247 'seeing a doctor' and looking after one's health. In late 2021 and early 2022, the UK
248 experienced multiple storms, of which Storms Arwen, Eunice, Franklin & Malik
249 particularly affected the northeast of Scotland (Topp & Britton, 2022; Rae, 2022). Both
250 the COVID-19 pandemic and the 2021/2022 storms brought the nature of rurality into
251 sharp relief and in particular how crises can have place-based effects on healthcare
252 access and delivery.

253 As articulated, travel distances can be difficult for those who live in rural areas. The
254 roll back and centralisation of primary care services in rural areas to community hubs
255 was underway prior to the COVID-19 pandemic, but alternative appointment styles,
256 including telephone or online, were not as commonly used. During the pandemic the
257 use of alternative appointment solutions, such as telephone or online appointments,
258 increased and an associated reduction in face-to-face consultations became the norm.

The 'Near Me' video system, introduced in 2018 to support Scottish rural and island communities, was scaled up from 336 video consultations a week before the national lockdown to 17,000 in the final week of June 2020 (The Scottish Government, 2020). Initial findings were that such a scale up of digital technologies in a rural healthcare setting was met with positive feedback by both practitioners and the public (The Scottish Government, 2020; see also The Scottish Government, 2022). Our findings showed more mixed opinions, often very much place, person and condition centred, as Jeremy, a GP with an extended role, articulates:

> *I would say it's a complete waste of time. I would have virtually no positives from it at all. First step in my experience is the IT rarely works, the chosen sort of platform, NHS Near Me, is buggy. It demands a very high broadband speed that isn't available in a lot of rural locations. Second point is, largely speaking, there's almost nothing you can do on a video call that you can't do on a normal telephone call, you know? The exception, I would say, is people with mental health ones, you can judge their affects, you know, their facial expressions and things like that, again, if your broadband speed is high enough! (Jeremy, GP Locum with Extended Role[v])*

Our public interviewees from rural areas spoke contrastingly about their frustrations of having to travel long distances for very short appointments against the positives of being able to conveniently speak to someone through digital or telephone means:

> *So actually [my daughter] tested positive with COVID…and she had an appointment [in secondary care] …. So, I phoned them up to cancel the appointment on the Monday morning and I said, 'well I could do it by Teams, if you want to do it by Teams?' And I was thinking, if I had taken her…the appointment was at half past ten I probably wouldn't have put [her] to school that morning, so that would have disrupted my working day anyway. It [then] takes me a minimum of half an hour to get from [home] to [health centre], then there's half an hour for the appointment, half an hour to come back, have to drop her off, so it's a good two plus hours out of my day. Whereas I had a chat with [the doctor] for twenty minutes online and I didn't need to do any of that travelling. So, for me that was great. (Liz, age 45-54)*

Those that were positive about online or telephone appointments still frequently highlighted how such eHealthcare approaches needed to be balanced with patient

290 needs but also sometimes with a reassurance that they are indeed being seen
291 physically:

292 *And I've not seen a doctor, certainly. I can understand that they have to prioritise, but*
293 *I do really feel the lack of face-to-face contact with a doctor (Elspeth, age 65+)*

294 *[My daughter] was doing physiotherapy online and that was quite difficult to do.*
295 *They were trying to show us how to do exercises, they can't tell, if you have to*
296 *physically feel a patient or check – there's only so much you can do online, I think. So*
297 *I think where, as her annual appointment in [a city], that's a whole day out of my*
298 *time and…you know, but I actually want her to be seen sometimes to, you know,*
299 *check, you know more than through a screen … it's not always just what you see on*
300 *the screen but general behaviour and I think you don't necessarily pick up everything*
301 *(Liz, age 45-54)*

302 Doctors equally had mixed feelings on the move to online and phone consultations
303 with both positive and negative responses:

304 *I have to say, I didn't enjoy it at all, you know? Working remotely by telephone or by*
305 *video is not why I went into medicine and is not how I choose to work. (Corrina, GP*
306 *Partner)*

307 *there was a lot of issues with patients not having access to, either the sort of device or*
308 *the internet being good enough to allow it to run smoothly, and [it's] quite difficult*
309 *for a lot of elderly people who are not used to [it]. I think you miss so much from that*
310 *kind of interaction, speaking over the phone, and we've had discussions in the practice*
311 *about things that have, you know, potentially been missed, and was that because you*
312 *just missed that the nuances of a conversation, (Becky, Salaried GP)*

313 *I think definitely it would be great to keep an element of it, for so many people and*
314 *myself included, instead of having to book time off, or arrange an afternoon, so much*
315 *more convenient. I think a lot of people, maybe more younger people, feel they, they*
316 *almost know what they want or need, and it's, it's just much easier to speak to*
317 *someone over the phone about it, and I think that, that probably will continue for*
318 *quite a lot of people and that they don't have to take time off work to, to come to the*
319 *appointment. (Elsa, Final year Speciality trainee in General Practice)*

320 Much of the worry about the use of online or telephone services centred around the
321 potential for exclusion of specific groups, in particular older people, though it was
322 acknowledged that might be changing:

323 *Yes, Near Me, that's the one. It's always a bit of a thought, trying some kind of new*
324 *platform, isn't it, to access it. It's always a bit worrying because you are worried that*
325 *you haven't opened the right browser. It's okay for us because we're used to doing*
326 *things like this [MS Teams], it's people who haven't done it… it could be quite*
327 *stressful for an older person that's just not that comfortable, and is not using*
328 *technology in the same way and…I wonder how the pandemic has changed that...*
329 *older people being exposed to technology now in ways they haven't before… It's the*
330 *element of the digital divide and whether that particular digital divide has decreased*
331 *because of COVID, how that changes people's attitudes and acceptance to, post-Covid*
332 *continuation of these kind of things. And also, just reflecting that I'm of a*
333 *demographic that I am seeing people on a day-to-day basis and it's actually more*
334 *convenient for me to do it quickly. Maybe if I was seeing nobody and I was lonely, I*
335 *would really value some in-person visits. (Janet, age 45-54)*

336 This relates especially to research which considered housebound older adults with
337 chronic pain and their attitudes to, and acceptance of, eHealth (Currie et al., 2015).
338 Much of this research found that feeling comfortable with the technology was
339 important, but also that there was not a desire to replace face-to-face visits, because
340 sometimes they were the only people that older people were seeing. Indeed, this social
341 point was related to by Claire:

342 *There's a sense of the community being in action across the services and that goes for*
343 *the library and that goes for the health centre… That's the kind of beating heart of the*
344 *community, in a way, is the, kind of – you know, the health centre; that's where you*
345 *bump into people, that's where also the different generations interact in ways that*
346 *they don't in shops. So yes, I'd say it's the only place really where people still have*
347 *dialogue across generations and across social classes and across different social*
348 *groups. So yes, I value that, definitely. The school as well, the school is kind of…it's*
349 *not as big a cross-section of the population that would build community there.*

350 *(Claire went on):*

351 *I think it's important for older people to go to the health centre, for them it's probably a*
352 *focus point in their day, it kind of helps with isolation. For children also, what they see*
353 *in action is a community that looks after its vulnerable people, that creates categories*
354 *and values in children's minds as they grow up and that shapes how they want to pay*
355 *their taxes, I'm sure in the future. And I think we should maintain that actively, I really*
356 *hope that survives. (Claire, age 45-54)*

357 Community centres or hubs are not just spaces for services but places that foster
358 interaction and care beyond their sole purpose, as geographical work has highlighted
359 elsewhere (e.g., Conradson, 2003; Milligan & Wiles, 2010).

360 As alluded to by many of the research participants, physical rural connectivity in terms
361 of transport infrastructure and service availability is not the only way connections have
362 been challenged. Rural digital connectivity and infrastructure have been challenging
363 issues for well over a decade. As faster broadband speeds become available in urban
364 areas, rural areas are often left behind leading to digital divides (Philip et al., 2017),
365 which can amplify health inequalities, an issue exacerbated during the pandemic
366 (Spanakis et al., 2021; Clare, 2021; Watts, 2020). However, digital development has
367 also led to unintended consequences for rural communities within the context of
368 extreme weather events. The declining use of landlines versus mobile phone and
369 internet use was brought into stark relief during the 2021/2022 storms:

370 *Yeah, well we'd been very worried about the…about BT saying they were going to*
371 *withdraw the landlines but, apparently, they've now put a moratorium on that*
372 *because there's been so many howls of rage. Really, if the power goes off, under the*
373 *system they were producing, once your mobile phone went out, that's it, you've had*
374 *it. And there is just nothing they could say, and I think they are now going to have to*
375 *keep their old analogue lines and just…I mean, just get on with it! Because basically,*
376 *I've often wondered, I mean my internet, you know I've got a browser up there, but*
377 *it's still plugged into the line so I'm trying to work out – all they were going to do*
378 *was close exchanges, it's still the same line that gives me…the internet comes*
379 *through, it's not satellite or anything like that, it comes through the landline so why*
380 *couldn't they just keep charging along with that. Anyway, there we are.*

381 *You know, electric cars, well that's a laugh, that's one of the things I'll be telling you*
382 *about health-wise and with all these power cuts, well anybody with a hybrid and electric*
383 *car were absolutely stumped. (Norman, 65+)*

384

385 *I told the doctor in Aberdeen that I spoke to. Basically, again, we were off for seven*
386 *days, the first time: no electricity, no water. Right? And then the second time – that*
387 *was Arwen, and then the second storm (whichever one it was called), we were off for*
388 *four days. So, we were one of the worst local areas to be hit. I personally felt very, very*
389 *strongly that my mother-in-law of ninety-six, who lives on her own, there should be*
390 *some trigger, and I'm not sure if that's the NHS or the council, but not one person*
391 *contacted myself or my husband it would have been, because we've got power of*
392 *attorney or whatever, to make sure she was alright. So, to me, and I know some people*
393 *that weren't alright. One of our neighbours was found after three days because, again,*
394 *quite old, no family that lives in this area. The family didn't…I told them that they*
395 *should have reported it, but they didn't, but the fact is, it was horrendous. Now, how*
396 *on earth, my husband landed up having to go and sit for seven nights with his mother*
397 *on a chair, because she's only got the one bedroom that was made up, because how can*
398 *you leave someone – normally she does stay overnight on her own but you couldn't*
399 *leave somebody with a Calor gas stove and a candle with Alzheimer's, and as I said,*
400 *there was not one single person, if I hear again about 'but you all had free*
401 *hamburgers', again, for any of us to access the free hamburgers, I wasn't wanting*
402 *them anyway, but to access the free hamburgers, that was in Turriff, initially, the first*
403 *seven days. Twenty miles round trip. Now how does a woman on her own, medically*
404 *incapacitated, access that? (Catriona, age 55-64)*

405 Health, rurality, digital infrastructure which had become so interconnected meant that
406 there was little resilience in the system when power lines went down as both landline,
407 internet and mobile phone signal all required that same power. In previous power
408 outages, analogue phone lines would often work, because telephone lines often take
409 power from the local telephone exchanges, which utilise back-up power. A shift to the
410 better, 'faster' and expanded digital infrastructure requires further rural considerations
411 and rural proofing policy.

Discussion and Conclusion

The nature of healthcare provision has changed, is changing, and the combined crises, of the COVID-19 pandemic and the recent storms experienced in Scotland, have brought the differing experiences of rural communities into sharp relief. To conclude we discuss possible policy approaches and directions based on our findings.

The nature of rural healthcare provision, in primary care particularly, has seen the closure and centralisation of GP practices, with many doctors handing back their contracts to NHS boards. In Scotland, the 2018 GP contract (The Scottish Government, 2017) - which included removal of rural fee supplements, awarded practice income supplements almost exclusively to urban practices and selectively failed to deliver GP-support services to rural areas (Rural GP Association of Scotland, 2018; Murphy et al., 2018; see also: Maclaren et al., 2022a) - further entrenched worry in staff around the future of rural primary care. Alongside the new model of care, with GPs seen as expert generalists directing a wider team of health professionals, the longer-term experiences of residents need to be considered, and how these changes are communicated to the public, as our research suggested a difference between younger and older people and what they expected their healthcare encounters to be like and with whom. Further research, then, around healthcare expectations that draws on prior, during and post pandemic experiences will be of particular use here. Many interviewers mentioned their embedded expectation of always seeing a doctor for every appointment, whereas it may be more appropriate for them to see a different practitioner from the wider team. An improved communication plan for the public could better close the gap between expectation and experience, by outlining that the new model of care is not necessarily a reduction in service level but a more appropriate use of resources for their individual issue.

For the development of increased use of virtual or telephone healthcare appointments, we see a requirement to consider virtual/tele/digital healthcare as a mixed economy approach where online consultations and triaging can be helpful but also appreciating individual preference or need. Indeed, this is most pressing where expectations of digital access (particularly digital divides between urban and rural areas), means appropriate technology (e.g., smartphones/device/computer access), and literacy are not evenly distributed across society and such differences are even more stark in rural places. Appropriate and effective use of such technologies or approaches to care

445 which reduce travel times and duplication of effort will be key here. Assumption of
446 digital access, means, and literacy have the potential to otherwise further exclude
447 members of society already at a disadvantage either through place based and socio-
448 economic differences. In the context of crises like the storms, such assumptions have
449 the potential to put individuals at risk. Rural residents are unlikely to have digital access
450 during storm conditions, with modern fibre optic connections susceptible to bad
451 weather and likely to be quickly inaccessible. This highlights the risk in transitioning
452 away from 'outdated' copper cabled systems for landlines, which are substantially
453 more resilient in storm conditions (Fisher, 2022). Such challenges have to be taken
454 into account for healthcare delivery during extreme weather events.

455 Place based differences are particularly apparent when we consider the wider
456 economic and social contexts of places. Aberdeenshire and the Grampian region may
457 not be explicitly Ageing Resource Communities as Skinner and Hanlon (2016)
458 previously defined, but they are economically resource-dependent and rural areas of
459 Scotland, such as Grampian, are ageing faster than urban ones. Further, the economy
460 of north-east Scotland is heavily entwined with the fortunes of the energy sector,
461 specifically the oil and gas industry, either directly through people's employment or
462 indirectly through the associated investment into the area's services. With the
463 acknowledged global need to move away from fossil fuels and thus the potential for
464 the economic position of the northeast of Scotland to be negatively affected, this
465 presents a potential risk to funding for public services, further pressuring the existing
466 fragility of rural healthcare delivery. This entwines the idea of a just transition away
467 from fossil fuels (Cha and Pastor, 2022) with the challenge of rural healthcare delivery
468 and asks how any "benefits of a green economy transition are shared widely, while
469 also supporting those who stand to lose economically" (EBRD, 2024, p.1) such as a
470 resource-dependent community like the northeast of Scotland. A true just transition
471 cannot happen without peripheral settlements, places, homes being brought along too,
472 where access to services is maintained, infrastructure developed and moves to
473 contemporary, clean technologies are robust enough to not exclude or marginalise
474 people in times of crises, or otherwise.

475

476 Many of the issues we discussed in this article – the centralisation of services in rural
477 areas, transport, digital inequality - are not new, rather they have been brought into
478 sharper relief by crises. To mitigate their effects, these fundamental differences and
479 place-based inequalities need to be addressed relationally within the context of wider
480 societal changes and moves towards changing digital infrastructure or just transitions
481 away from fossil fuel reliance need to be a pillar around which such changes need to
482 support and maintain.

483 The benefit of this work has been the relational comparison between practitioner and
484 public perspectives on rural healthcare in the context of crises. Whilst we appreciate
485 this research draws on pilot work with the public and focusses on doctors with
486 experience working in rural areas, it sets the ground we hope for further studies that
487 expand the focus to consider place, policy and practice in the delivery of rural
488 healthcare, where new research will usefully encompass wider experiences and
489 expectations of the public and healthcare professionals and how these have changed
490 over time.

491

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[i] Rural encompasses a diversity of spaces: in Scotland the Scottish Government has multiple levels of measuring rurality, including remote, rural, accessible rural, remote small towns and islands (The Scottish Government, 2016).

[ii] *Asynchronous discussion group*: An asynchronous online discussion group allows participants to post a comment at any time convenient to them. Participants are still asked pre-determined questions which can be posted at varying time intervals (or all at once) but participants move topics along through 'threads' on each question. "The asynchronous format means participants can respond to each other at any time. They can even go back to previous comments or conversations to add depth and insight. This not only allows people to contribute at a preferred time, location, and pace, but also permits multiple conversations to happen at the same time, without disrupting the overall group flow" (Touchette, 2020, p. 1)

Synchronous Focus group: A synchronous focus group happens in person, either physically or online (e.g. via Teams) at one time. The conversation is directed by a researcher through questions and prompts but happens through dialogue between and with participants' own conversations with the group. Once the focus group finishes the conversation ends.

[iii] For further information on the associated project see Authors-a., 2022a, 2022b; Authors-b., 2023.

[iv] General practice in Scotland is structured around practices run by NHS boards with employees or practices run on Service contracts where a GP runs a practice as a service for a trust/board. These GPs are known as GP Partners, where there is more than one, or single-handed GPs if they are sole GPs. The latter is common in rural practices. GPs who work as employees are often referred to as 'salaried GPs' so as to distinguish from GP partners/single handed GPs. For more information see: General Practice | GPs and Other Practice Workforce | Glossary | Health Topics | ISD Scotland

[v] A GP with Extended Role (sometimes referred to as special interest) is a GP who in addition to general practice, undertakes a role that is beyond the scope of GP training and has required further training. See: https://www.rcgp.org.uk/your-career/gp-extended-roles